# What I’ve Learned About Computing

CS 101. Computers: Applications and Implications

## Table of Contents

1. Introduction ........................................... 1
2. Prepare to Succeed! ................................. 3
3. How the Internet Works .............................. 5
4. How Search and Digital Knowledge Works ... 7
5. How Privacy and Security Works .................. 8
6. Wellness and Making Computing Changes ....... 9
8. How Hardware Manufacturing Works .......... 14
9. The State of Computing ............................. 18
10. How to Finance your Greatest Dream .......... 20
Bibliography .............................................. 23

© 2019 Van Londen
1 Introduction

Hello! I reside in Oregon in the USA.

I am your instructor for this course as well as Gender & Technology, Web Design, Web Management, and Ethics in Computer Science courses. I have two grown children and a scruffy, noisy dog. I have a Master's degree in Interdisciplinary Studies, which includes Art, Computer Science, and Instructional Technology. I've been teaching courses at OSU since 2004.

I like to use my phone to listen to web pages and audiobooks when I am riding the bus or it is too hot to use my computer. On my Chromebook, I use the Chrome’s SpeakIt extension to listen to articles I want to add to course materials. Adding an extension to Chrome is easy...I use the 3-dot menu to locate the More Tools > Extensions screen, then scroll to the bottom to add a new one. Once I search for listening, I have a few options to install. These options show up next to the Address bar of the browser so I can just click when I want to listen.

I set up Canvas Notifications for all my courses so I am immediately notified when students have written to me via the Inbox or Assignment Comments. The first deadline is easy to find in the Coming Up list, the Assignment/Module list, or the Calendar.

Because I have so many Canvas Discussions to score each week, I use the expand/contract icons, the search, and the reveal arrow to narrow down the amount of scrolling. Because I make a lot of typos, I use the Edit thread menu to fix problems. I use the link, image, media, and list editing icons to improve the way the threads look. To quickly get to Canvas, I just type part of the word 'oregon' and Chrome remembers my options. I choose the correctly spelled URL to get here.

At home, I use a 14" Acer Chromebook computer with a 1080px resolution high definition display. The keyboard is compact and the trackpad is big. The Chrome OS operating system is "edgar" version 10176.72.0 (Official Build) stable-channel and the browser is Chrome 64.0.3282.167, which I found by typing: chrome://system/ into the Chrome browser address bar. This screen loads slowly for some reason. I also found it by clicking on the system settings icon clicking the Device option. The Random Access Memory (RAM) holds 2gb of data. Read-only Memory (ROM) is harder to locate. I used a Google search to locate articles that tell me I have 8Mb. The system settings tell me there is an Intel(R) Celeron(R) CPU number N3160 running at 1.60GHz. The computer comes with an internal Solid State Drive (SSD) which holds 32Gb of data. I can plug in two USB devices, one MDMI, and one pair of headphones. It also has a security cable port.
My hard drive (SSD) is not well organized because it is mainly a downloads folder, which I delete periodically after moving the files to folders on my two Google cloud drives. I made folders for each class on the drive and within them, add term-specific folders, then I add ShortCuts (aliases or favorites) to the system menu. All other projects I’m involved in have folders inside folders so I can quickly locate and backup multiple items. Using search is the fastest way to find a file, however. The Chromebook does not have a 'desktop' area, so I can’t overrun that area with all of my files, which would slow down processing.

Since I learned to use an Apple IIe computer in 1985, I have been typing with keystrokes. I started with Save, then Open, then close the Window, select All, Bold...and many others.

I use the Grammarly for Chrome grammar checker because I am an inaccurate typist. I described above how I added an extension for SpeakIT and the process is the same. Google Docs does have spell checking but it isn't as helpful as Grammarly. It also works well in Wordpress, where I spend a lot of time. I forget to add items to the personal dictionary, which would save me time in the long run.

Extra Credit: I see my Canvas calendar inside my Google Calendar, but it doesn’t sync often enough to be helpful. It is there by default when I am logged into my OSU Google account. I can change the settings and activate notifications if I like.
2 Prepare to Succeed!

The Writing Samples article shows four ways to write but demonstrates the required style for this course. In general, the paragraphs must be written in the third-person and state who said what with lots of details. The titles of articles should be hyperlinked to their sources, and keywords must be bolded. There is no need to introduce each article beyond stating the title and what it says. And the writing must be in our own words rather than copied from the textbook.

The Modern Learning article mentions several ways that teaching and learning have changed recently. Learning may include searching for definitions, tutorials, detailed explanations, and interactive media to increase knowledge and skills. Learning can also occur without lectures or books and often takes place when students interact with each other around a shared concept, which some call ‘open source’ or ‘crowdsourcing’ or ‘crowdlearning’. Kapur says that when groups come up with ideas together, they often begin to understand the structure of solutions so they can solve big problems. Mitra suggests that we don’t need teachers when students can teach themselves if they just have access to devices that connect to knowledge banks like a search engine or video channel.

The Obligations article notes that this course is for lower division students from any college. EECS and OSU expect up to a 12-hour per week commitment, though in the summer, it could be more due to the shorter time-frame. Students are expected to write like professionals after using the instructions, videos, and criteria. When research is required, it is a good idea to consult with the Librarians at OSU or Answerland. Students should ask for help using the Canvas Inbox. When students have questions about scores, then they should ask in the Assignment Comments.

The Cyberbullying article mentions that 70% of students have been bullied online and that schools may not take the issue seriously. This could be because the incidents happen outside of classroom communications tools like Canvas. Social media like Facebook and Twitter are the main places and some people have been prosecuted for causing psychological harm and even death. Some people will not only harass in writing, but by hacking, tricking, flaming, excluding, stalking, outing, trolling, catfishing, and masquerading. Some are chronic perpetrators never get caught because they hide behind their anonymous account name. Facebook and other sites provide a way to report bullies or to block them. Campus security or local law enforcement can help victims to take action other than blocking. The Civil Rights Act and Title IX Act have provisions for prosecution. Social sites will sometimes help by providing details about removing offending materials from websites.

The Avoiding Plagiarism article mentions how plagiarism, cheating, and copyright infringement are three separate problems to avoid. Quotation marks must be placed around any text that is copied from someone else’s writing. Quote only
a few items in a section/chapter. Students must write in their own words otherwise. Students should use a **bibliography tool** to keep track of each source they mention in their writing so that they can easily make inline citations for quotes and other ideas, laws, statistics, etc. If displaying an image or movie, then students need to add a **copyright statement** that uses a symbol, year, and copyright owner’s name. In some cases it is OK not to ask for permission to use other people’s media because of the **Fair Use** provision of the USA Copyright law. Cheating by collaborating, using other student’s sources, using work from other class projects, or purchasing finished work isn’t allowed unless specifically stated.

**Checking Originality in TurnItIn** diagrams a comparison of **plagiarized versus synthesized text** with **inline citations** that use a combination of hyperlinked titles and parenthetical references after sentences/paragraphs. The colored **flag icons** with percentages are not as reliable as looking at the Originality report. If the report shows any **highlighted** text, then it can be corrected and resubmitted before the deadline. Highlighting of cover pages, common phrases, and bibliography entries can be ignored.
3 How the Internet Works

Internet: Wires, Cables, and Wifi describes undersea cables that connect each continent and country to other continents and countries. They span across oceans and contain high-speed fibre optic wires that can send bits of data at the speed of light, which is faster than electricity or copper. Radio waves are the frequency that wifi signals are sent on from our devices to a router. That router often connects with a modem that uses Ethernet/copper cables to connect to an Internet Service Provider (ISP).

The Internet: Encryption & Public Keys and HTTP and HTML say that Hypertext Transfer Protocol (HTTP) is the language that one computer uses to talk to another computer over the Internet. A computer will use HTTP get requests to ask the other computer for some data. Hypertext Transfer Protocol Secure (HTTPS) is an encrypted version of that data transfer. Modern encryption uses 256 bits to secure a transfer, which would take trillions of years to decrypt. The internet makes use of asymmetric keys and digital certificates between one device and another to create an additional level of security, which is also called Secure Socket Layer (SSL) or Transport Layer Security (TLS). When you see https:// in the browser it means that SSL or TSL is active.

The Internet: Packets, Routing, and Reliability mentions that information (data) sent from one device to another doesn’t stay together or follow a straight path...it is sent in packets, or chunks, of binary code, to various web servers as if in a maze. The maze contains many other web servers that send and receive packets. Some of the packets have cookies attached which the browser can use to speed up logging in or other preferences. Routers send and receive packets via wi-fi signals to the modem, which connects to the ISP’s physical cables in the wall of a building. Those cables connect to ISP web servers which reassemble the packets so the entire message can viewed.

The Internet: IP Addresses and DNS says that Transmission Control Protocol/Internet Protocol (TCP/IP) is the name given to the process explained above...the sending and receiving of packets via signals and cables to display web pages. It is the World Wide Web (WWW). Domain Name Servers (DNS) host the names of websites that point to specific Internet Protocol (IP) addresses on web servers. Web servers are large computers designed to store huge amounts of data so humans can view and interact with web pages or stream media.

The Internet: HTTP and HTML explains that browsers are designed to display web pages that humans request from their devices. Browsers read Hypertext Markup Language (HTML), which is a set of tags (or marks) added to text and images to display them with style, functionality, and links.
Images, Pixels, and RGB describes how HTML pages can include images and movies, however they are requested separately than the HTML pages and may load slower than the text. Images are recreated with pixels, which are one dot of red (R), green (G), and blue (B) light on a screen. The resolution of a screen is the height and width dimension of pixels it has. Density of pixels on the screen allows even more detail. The RGB values for a color are stored in eight bits (a byte) up to 255. Instead of representing color with binary, hexadecimal code is often used because it reduces the complexity of a long set of ones and zeros. Photo filters modify these RGB values.

Here is a diagram illustrating how the Internet works:
5 How Privacy and Security Works
6 Wellness and Making Computing Changes
7 How Software Development Works
8 How Hardware Manufacturing Works
9 The State of Computing
10 How to Finance your Greatest Dream
Bibliography